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[Title of Invention] TOOTHBRUSH

[Claims]

1. A cylindrical toothbrush capable of handling a tooth flank from 360 degrees, wherein bristles of the toothbrush comprise many hair material brush members in a cylindrical form having a center at an arm shaft.

2. The toothbrush according to claim 1, wherein using the arm shaft as a small penetrating hole, an appropriate number of annular hair material brushes are inserted, and a front end portion of the small penetrating hole is fixed with ultrasonic wave welding.

3. The toothbrush according to claim 1, wherein using the arm shaft as a small penetrating hole, an annular hair material brushes and washers are alternately inserted so as to arrange an appropriate number of annular hair material brushes with a regular

interval, whereby a front end portion is fixed with ultrasonic wave welding.

[Detailed Description of the Invention]

[Technical Field]

[0001]

The present invention relates to a toothbrush used in an ordinary household.

[Background Art]

[0002]

Conventional household toothbrushes have features in the forms to remove adherents such as plaque adhered to tooth flanks and give massage depending on users of the toothbrushes. Although the toothbrushes are different in cuttings of bristles, forms of the ends of the bristles, the thickness, the length, the hardness of the bristle, and the like, most of them are implanted-brush in which bristles are vertically implanted to an arm of a head portion.

[0003]

There are provided various kinds of toothbrushes such as rotating brushes having roller shapes which are effective for removing plaque and giving massage to gums, although they are not affordably-priced tooth brushes in which bristles are vertically implanted to an arm of a head portion (for example, see Patent Document 1).

[Patent Document 1] Japanese Patent Laid-Open No. 2003-220080

[Disclosure of the Invention]

[Problems to be Solved by the Invention]

[0004]

However, in the above-explained affordably-priced conventional toothbrushes, bristles are implanted to an arm. Therefore, the toothbrush has a limitation in the density of bristles and forms in terms of the structure, which also causes limitation in the effect of removal of plaques and polishing. A toothbrush is provided to improve this issue and totally change the structure, whereby the toothbrush not only has plaque removal effect but also achieves massage effect. In particular, the toothbrush is suitable for prevention and treatment of periodontal disease and gingivitis.

[0005]

The conventional toothbrush has a vertical angle with respect to a tooth flank unless the form of the end of the bristle is changed or the arm shaft is bent to a certain angle. Moreover, since implanted brushes are mainly used, the density of the brush is rough, and the massage effect to gums is doubtful. On the other hand, in the rotating brushes having roller shapes which are effective for giving massage to gums in order to solve this problem, the frictional resistance is extremely low, and the brushes slip on a tooth flank, which causes a problem in that the plaque removal effect is insufficient.

[0006]

The present invention is made to solve the problems of the

conventional configuration as described above, and it is an object of the present invention to achieve not only massage effect to gums but also plaque removal effect by totally changing the structure and causing bristles to be densely and flexibly overlaid on each other against a tooth flank.

[Means for Solving the Problems]

[0007]

To achieve the above object, in the present invention, multiple annular hair material brush members are placed on each other about a center at an arm shaft, and are inserted into the arm shaft, whereby a cylindrical form is made. As a result, the entire surface is implanted with bristles. Therefore, the ends of the bristles can be repeatedly moved while applying a light pressure in a horizontal direction, a vertical direction, a circular direction, or the like from any surface, and the cylindrical toothbrush can remove plaques and give massage to gums.

[0008]

In the means for solving the second problem, using the arm shaft as a small penetrating hole, an appropriate number of annular hair material brushes are inserted, and a front end portion of the small penetrating hole is fixed with ultrasonic wave welding. As a result, the strength for fixing the bristles is equal to or more than 8N of implanted brush standard of JIS (Japanese Industrial Standards, s3016-1995).

[0009]

The effects of the means for solving the first problem are as follows. The density of bristles greatly improves, and the ends of the bristles rise in a manner different from implanted brushes. Therefore, the toothbrush is provided, which not only has plaque removal effect but also achieves massage effect. In particular, the toothbrush is suitable for prevention and treatment of periodontal disease and gingivitis.

[0010]

The effects of the means for solving the second problem are as follows. The entire surface is implanted with bristles, and portions of bristles of all the 360 degrees surface can be used. In terms of operation, when the toothbrush is used to brush teeth, it is not necessary to turn a wrist due to 360 degrees brush. Further, since the density of bristles is dense, the brush comes into contact with the tooth flank in a uniform manner without moving the hand in the horizontal direction. Therefore, there would be no portion that is not polished by the brush.

[Advantages of the Invention]

[0011]

As described above, the toothbrush according to the present invention has the structure of 360-degrees cylindrical toothbrush. Therefore, a massage effect can be achieved without harming gums. At the same time, plaque removal effect is obtained. When a back tooth is polished, bristles come into contact with even portions in a mouth that do not come into contact with a tooth flank. Therefore, saliva is actively produced, and superior

self-cleaning effect can also be achieved.

[0012]

Since the structure is the 360-degrees cylindrical toothbrush, the density of bristles is sufficiently ensured, which is important as a quality of a toothbrush. The toothbrush having bristles rising in a preferable manner and having superior cleaning effect can be provided. The toothbrush providing a preferable sense of use during brushing and having superior durability of the implanted bristles portion can be provided.

[0013]

The portions of the bristles on the entire 360 degrees surface can be used. In terms of operation, it is not necessary to turn a wrist due to 360 degrees brush. Therefore, even an infant who does not know how to brush teeth can easily handle the toothbrush.

[Best Mode for Carrying Out the Invention]

[0014]

The present embodiment will be hereinafter explained with reference to Figs. 1 to 4.

[0015]

In the figures, Fig. 1 is a schematic view illustrating one annular hair material brush member. One toothbrush is formed by laying a plurality of brush members. Fig. 2 is a schematic view illustrating the toothbrush seen from above. Fig. 3 is a cross sectional view illustrating the toothbrush seen from a side.

[0016]

In Fig. 1, one annular hair material brush member is shown. Further, a plurality of brush members having the number of bristles suitable as a toothbrush are inserted into a portion of an arm shaft 1c of Fig. 2 through axial holes, whereby a form appropriate as a toothbrush is made.

[0017]

Further, an appropriate number of annular hair material brush members is inserted into a portion of the arm shaft, and a front end portion of the arm shaft is fixed with ultrasonic wave, whereby the forms as shown in Figs. 2 and 3 are made.

[0018]

In order to arrange the annular hair material brush members with a regular interval, washers are arranged between brushes as shown by 2c, and the front end portion of the arm shaft is fixed with ultrasonic wave, whereby the form as shown in Fig. 4 is made.

[0018]

Since the brush arm shaft is made with synthetic resin fibers such as nylon, the brush arm shaft can be easily welded with ultrasonic wave, and this prevents the hair material brushes from coming off.

[Brief Description of the Drawings]

[0019]

[Fig. 1]

Fig. 1 is a basic figure illustrating one annular hair material brush member illustrating the embodiment of the present invention.

[Fig. 2]

Fig. 2 is a schematic view (front view) illustrating the toothbrush seen from the above.

[Fig. 3]

Fig. 3 is a schematic view (side view) illustrating the toothbrush seen from a side.

[Fig. 4]

Fig. 4 is a schematic view (front view), in which washers are arranged between annular hair material brushes according to claim 3 and brushes with a regular interval.

Fig. 2

Schematic view seen from the above (front view)

Fig. 3

Schematic view seen from a side (side view)

Fig. 4

Schematic view seen from a top (front view)

[Amendment]

[Filing Date] August 2, 2004 (2004.8.2)

[Amendment 1]

[Title of Document to be Amended] Claims

[Title of Item to be Amended] All text

[Method of Amendment] Change

[Content of Amendment]

[Claims]

1. A toothbrush comprising an arm having such a shape that can be held with one hand and capable of being reciprocally moved, and cylindrical bristles arranged at a front end portion of the arm,

wherein the arm comprises an arm shaft having a small diameter arranged to extend the arm to the front end portion, and

wherein an appropriate number of cylindrical bristles are arranged around the arm shaft by alternately passing, through the arm shaft, washers and thin annular hair material brush member having a small hole passed though the arm shaft.

2. The cylindrical toothbrush according to claim 1, wherein the arm shaft is made of a thermoplastic resin, and the annular hair material brush member passed though the arm shaft is fixed to the front end portion of the arm shaft with ultrasonic wave welding.

[Amendment 2]

[Title of Document to be Amended] Specification

[Title of Item to be Amended] All text

[Method of Amendment] Change

[Content of Amendment]

[Detailed Description of the Invention]

[Technical Field]

[0001]

The present invention relates to a tooth brush used in an ordinary household.

[Background Art]

[0002]

Conventional household toothbrushes have features in the forms suitable for the users of the toothbrushes to remove adherents such as plaque adhered to tooth flanks and giving massage. Although the toothbrushes are different in cutting of bristles, the form of the ends of the bristles, the thickness of the bristle, the length, the hardness and the like, most of them are implanted brush in which bristles are vertically implanted to an arm of a heat portion.

[0003]

There are provided various kinds of toothbrushes such as rotating brushes having roller shapes which are effective for removing plaque and giving massage to gums, although they are not affordably-priced tooth brushes in which bristles are vertically implanted to an arm of a head portion (for example, see Patent Document 1).

[Patent Document 1] Japanese Patent Laid-Open No. 2003-220080

[Disclosure of the Invention]

[Problems to be Solved by the Invention]

[0004]

However, in the above-explained affordably-priced conventional toothbrushes, bristles are implanted to an arm. Therefore, the toothbrush has a limitation in the density of bristles and forms in terms of the structure, which also causes limitation in the effect of removal of plaques and polishing. It is an object of the present invention to provide a toothbrush that improves this issue and totally changes the structure, whereby the toothbrush not only has plaque removal effect but also achieves massage effect. In particular, the toothbrush is suitable for prevention and treatment of periodontal disease and gingivitis.

[0005]

The conventional toothbrush has a vertical angle with respect to a tooth flank unless the form of the end of the bristle is changed or the arm shaft is bent to a certain angle. Moreover, since implanted brushes are mainly used, the density of the brush is rough, and the massage effect to gums is doubtful. On the other hand, in the rotating brushes (see Patent Document 1) having roller shapes which are effective for giving massage to gums in order to solve this problem, the frictional resistance is extremely low, and the brushes slip on a tooth flank, which causes a problem in that the plaque removal effect is insufficient.

[0006]

The present invention is made to solve the problems of the

conventional configuration as described above, and it is an object of the present invention to achieve not only massage effect to gums but also plaque removal effect by totally changing the structure and causing bristles to be densely and flexibly overlaid on each other against a tooth flank.

[Means for Solving the Problems]

[0007]

In order to achieve the above object, a toothbrush according to the present invention includes an arm having such a shape that can be held with one hand and capable of being reciprocally moved, and cylindrical bristles arranged at a front end portion of the arm, wherein the arm comprises an arm shaft having a small diameter arranged to extend the arm to the front end portion, and wherein an appropriate number of cylindrical bristles are arranged around the arm shaft by alternately passing, through the arm shaft, washers and thin annular hair material brush member having a small hole passed though the arm shaft. Therefore, multiple annular hair material brush members are placed on each other about a center at an arm shaft, and are inserted into the arm shaft, whereby a cylindrical form is made. As a result, the entire surface is implanted with bristles. Therefore, the ends of the bristles can be repeatedly moved while applying a light pressure in a horizontal direction, a vertical direction, a circular direction, or the like from any surface, and the cylindrical toothbrush can remove plaques and give massage to gums.

[0008]

The means for solving the second problem is characterized in that the arm shaft is made of a thermoplastic resin, and the annular hair material brush member passed though the arm shaft is fixed to the front end portion of the arm shaft with ultrasonic wave welding. Therefore, an appropriate number of annular hair material brush members are inserted around the arm shaft, and a front end portion of the arm shaft is fixed with ultrasonic wave welding. As a result, the strength for fixing the bristles is equal to or more than 8N of implanted brush standard of JIS (Japanese Industrial Standards, s3016-1995).

[0009]

The effects of the means for solving the first problem are as follows. The density of bristles greatly improves, and the ends of the bristles rise in a manner different from implanted brushes. Therefore, the toothbrush is provided, which not only has plaque removal effect but also achieves massage effect. In particular, the toothbrush is suitable for prevention and treatment of periodontal disease and gingivitis. Therefore, the entire surface is implanted with bristles, and portions of bristles of all the 360 degrees surface can be used. In terms of operation, when the toothbrush is used to brush teeth, it is not necessary to turn a wrist due to 360 degrees brush. Further, since the density of bristles is dense, the brush comes into contact with the tooth flank in a uniform manner without moving the hand in the horizontal direction. Therefore, there would be no portion that is not polished by the brush.

[0010]

The effects of the means for solving the second problem is that the welding can be performed easily with ultrasonic wave, and the hair material brush member can be prevented from coming off.

[Advantages of the Invention]

[0011]

As described above, the toothbrush according to the present invention has the structure of 360-degrees cylindrical toothbrush. Therefore, a massage effect can be achieved without harming gums. At the same time, plaque removal effect is obtained. When a back tooth is polished, bristles come into contact with even portions in a mouth that do not come into contact with a tooth flank. Therefore, saliva is actively produced, and superior self-cleaning effect can also be achieved.

[0012]

Since the structure is the 360-degrees cylindrical toothbrush, the density of bristles is sufficiently ensured, which is important as a quality of a toothbrush. The toothbrush having bristles rising in a preferable manner and having superior cleaning effect can be provided. The toothbrush providing a preferable sense of use during brushing and having superior durability of the implanted bristles portion can be provided.

[0013]

The portions of the bristles on the entire 360 degrees surface can be used. In terms of operation, it is not necessary to turn a wrist due to 360 degrees brush. Therefore, even an infant

who does not know how to brush teeth can easily handle the toothbrush.

[Best Mode for Carrying Out the Invention]

[0014]

The present embodiment will be hereinafter explained with reference to Figs. 1 to 4.

[0015]

In the figures, Fig. 1 is a schematic view illustrating one annular hair material brush member. One toothbrush is formed by laying a plurality of brush members. Fig. 2 is a schematic view illustrating the toothbrush seen from above. Fig. 3 is a cross sectional view illustrating the toothbrush seen from a side.

[0016]

In Fig. 1, one annular hair material brush member is shown. This hair material brush member 2 has an axial hole 2a in a central portion, and an appropriate number of bristles are arranged on the toothbrush in a radiating manner. Further, as shown in Fig. 2, a portion of the arm shaft 1c arranged at the front end of the arm 1b is passed through the axial hole 2a of this hair material brush member2, and the multiple hair material brush members 2 are attached around the arm shaft 1c, whereby a form appropriate as a toothbrush is made.

[0017]

Further, an appropriate number of annular hair material brush members 2 are inserted into a portion of the arm shaft 1c, and a front end portion of the arm shaft 1c is fixed with ultrasonic

wave, whereby the form of the toothbrush 1 as shown in Figs. 2 and 3 is made. It should be noted that Figs. 2 and 3 illustrate reference examples of toothbrushes, in which no washer is used.

[0018]

In the present embodiment, the annular hair material brush members 2 are arranged with a regular interval. Therefore, when the washer 2c is placed between the hair material brush member 2 and the hair material brush member 2 as shown in Fig. 4, and the front end portion of the arm shaft 1c is fixed with ultrasonic wave, the form of the toothbrush 1 as shown in Fig. 4 is obtained. When the hair material brush member 2 and the arm shaft 1c are made with synthetic resin such as nylon, they can be easily welded with ultrasonic wave, and this prevents the hair material brushes 2 from coming off from the arm shaft 1c.

[Brief Description of the Drawings]

[0019]

[Fig. 1]

Fig. 1 is a top view illustrating an embodiment of an annular hair material brush member used for a booth brush according to the present invention.

[Fig. 2]

Fig. 2 is a schematic view (front view) illustrating a reference example of a toothbrush using the hair material brush member seen from the above.

[Fig. 3]

Fig. 3 is a schematic view (side view) illustrating the

toothbrush seen from a side.

[Fig. 4]

Fig. 4 is a schematic view (front view) illustrating an embodiment of a toothbrush according to the present invention.

[Description of Symbols]

[0020]

1 toothbrush

1b arm

1c arm shaft

2 hair material brush member

2a shaft hole

2c washer

[Amendment 3]

[Title of Document to be Amended] Drawings

[Title of Item to be Amended] All drawings

[Method of Amendment] Change

[Content of Amendment]

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(54)【発明の名称】歯ブラシ

(57)【特許請求の範囲】
【請求項１】
片手で握り往復移動させることができる形状の柄と、その柄の先端部に設けられる円筒状の刷毛とを備え、
前記柄がその先端部に柄を延長するように設けた小径の柄軸を備えており、
前記円筒状の刷毛が、柄軸の周囲に、中心部に柄軸に通される小孔を有する薄い環状の毛状ブラシ材とワッシャーとを、交互に柄軸に通して適正枚数並べることにより構成される、
歯ブラシ。
【請求項２】
前記柄軸が熱可塑性樹脂製であり、前記柄軸に通した環状の毛状ブラシ材を、柄軸の最先端部分を超音波溶着することにより止めた請求項１記載の円筒歯ブラシ。
【発明の詳細な説明】
【技術分野】
【０００１】
本発明は、一般家庭で利用される歯ブラシに関する。
【背景技術】
【０００２】
従来の家庭用歯ブラシは、歯面に付着している歯垢などの付着物を取り除いたり、マッサージしたりするのに、使用対象者に合わせた形態的特徴を持つものがあるが、毛束の刈

り込み方、毛先の形態、刷毛の太さ、長さ、硬さなどが異なるものの、その多くが、刷毛を頭部の柄に垂直に植毛する植込みブラシである。

【０００３】

また、刷毛を頭部の柄に垂直に植毛する普及型の歯ブラシではないものの、歯垢の除去及び、歯ぐきのマッサージに効果的なローラ状としてなる回転歯ブラシなど各種の歯ブラシが提供されている。（例えば、特許文献１参照）

【特許文献１】特開２００３－２２００８０号公報

【発明の開示】

【発明が解決しようとする課題】

【０００４】

以上に述べた従来の普及型歯ブラシでは、柄に刷毛を植込んでいたため、構造上、植毛密度や形態に限界があり、したがって、歯垢除去や研磨力の効果にも限界があった。本発明はその点を改善し、構造を全く変えることで、歯垢除去効果だけでなく、マッサージ効果、特に歯周疾患や歯肉炎の予防と治療にも適した歯ブラシを提供することを目的とする。

【０００５】

また、従来の歯ブラシは、毛先の形態を変えたり、柄軸に角度を持たせない限り、歯面に対する角度は垂直のままである。また、植込みブラシが主流のため、ブラシ密度が粗く歯ぐきのマッサージ効果に疑問がある。同時に、その課題に取り組んだ歯ぐきのマッサージに効果的なローラ状としてなる回転ブラシ（特許文献１参照）は、摩擦抵抗力が著しく低いため、歯面を滑ってしまい歯垢除去が不十分という問題も生まれた。

【０００６】

本発明は、このような従来の構成が有していた問題を解決しようとするものであり、構造を全く変えることで、歯面に対して刷毛が柔軟かつ綿密に重ね合わさり、歯ぐきのマッサージ効果の向上の実現と、同時に歯垢除去効果を目指すことを目的とするものである。

【課題を解決するための手段】

【０００７】

本発明の歯ブラシは上記目的を達成するために、片手で握り往復移動させることができる形状の柄と、その柄の先端部に設けられる円筒状の刷毛とを備え、
前記柄がその先端部に柄を延長するように設けた小径の柄軸を備えており、前記円筒状の刷毛が、柄軸の周囲に、中心部に柄軸に通される小孔を有する薄い環状の毛状ブラシ材とワッシャーとを交互に柄軸に通して適正枚数並べることにより構成される。このように柄軸を中心として環状の毛状ブラシ材を複数枚重ね合わせ、柄軸に通すことで円筒状となり、全面的に植毛された状態になるので、どの面からも左右・上下・回転など、軽い圧力を加えながら毛先の移動を繰り返す動作を行うことができ、歯垢の除去や歯肉マッサージを行える円筒型歯ブラシとなる。

【０００８】

また、第２の課題解決手段は、前記柄軸が熱可塑性樹脂製であり、前記柄軸に通した環状の毛状ブラシ材を、柄軸の最先端部分を超音波溶着することにより止めたことを特徴とする。このように柄軸の周囲に環状の毛状ブラシ材を適正枚数通し、柄軸の最先端部分を超音波溶着することで、毛止めの強度は、ＪＩＳ（日本工業規格　ｓ３０１６－１９９５）植込みブラシ規格８Ｎ以上の強度になった。

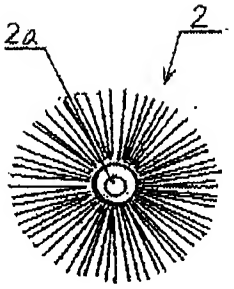
【０００９】

上記第１の課題解決手段による作用は次の通りである。植毛密度が格段に向上し、植込みブラシにはなかった毛先の立ち方のため、歯垢除去効果だけでなく、マッサージ効果、特に歯周疾患や歯肉炎の予防と治療にも適した歯ブラシを提供できるようになった。すなわち全面的に刷毛を植毛することで、３６０°面すべての刷毛の部分を利用でき、操作面でも、歯を磨く時、３６０°ブラシのため、手首を返す必要がなくなった。また、植毛密度が高いため、左右に手を動かさなくても歯面に均等にブラシが当たり、磨き残しがなくなった。

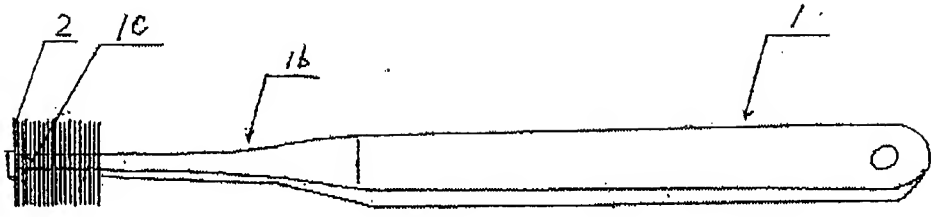
【００１０】
また、第２の課題解決手段による作用は、超音波で容易に溶着でき、毛状ブラシ材の脱落防止ができる点である。
【発明の効果】
【００１１】
上述したように本発明の歯ブラシは、構造を３６０°型円筒歯ブラシにすることによって、歯ぐきを痛めることなくマッサージ効果を発揮することができ、同時に歯垢除去効果も得られる。また、奥歯など歯を磨く時も、歯面に当たらない部分にも刷毛が口内部分に当たることで、唾液の分泌が活発になり、優れた自浄効果も発揮できるようになった。
【００１２】
構造を３６０°型円筒歯ブラシにすることによって、歯ブラシ品質として重要である植毛強度を十分に確保させ、毛立ちが良好で、清掃効果に優れた歯ブラシを提供するが可能になった。また、ブラッシング時の使用感がよく、かつ、植毛部の耐久性に優れた歯ブラシを提供することが可能になった。
【００１３】
３６０°面すべての刷毛の部分を利用でき、操作面でも、３６０°ブラシのため、手首を返す必要がなくなり、歯の磨き方がわからない幼児でも容易に使えるようになった。
【発明を実施するための最良の形態】
【００１４】
以下、本発明の実施の形態を図１～４に基づいて説明する。
【００１５】
図において、図１は、環状の毛状ブラシ材１枚の概観図であり、複数枚重ね合わせることで、一つの歯ブラシになる。図２は、同歯ブラシの上から見た概観図、図３は、同歯ブラシの側面から見た断面図である。
【００１６】
図１では、環状の毛状ブラシ材１枚を取り上げたものであり、この毛状ブラシ材２は中心部に軸孔２ａを備え、歯ブラシに適当な本数の毛を放射状に設けている。さらに図２のように、柄１ｂの先端に設けた柄軸１ｃの部分をこの毛状ブラシ材２の軸孔２ａに通すようにして、柄軸１ｃの周囲に毛状ブラシ材２を何枚も装着し、歯ブラシとして適切な形に仕上げる。
【００１７】
また、柄軸１ｃの部分に、環状の毛状ブラシ材２を適正枚数通し、柄軸１ｃの最先端部分を超音波で固定し、図２・図３の歯ブラシ１の形態にする。なお図２・図３はワッシャーを用いていない参考例の歯ブラシを示す。
【００１８】
本発明では、環状の毛状ブラシ材２を等間隔で並べるため、図４に示すように毛状ブラシ材２と毛状ブラシ材２の間にワッシャー２ｃを入れ、柄軸１ｃの最先端部分を超音波で固定すると、図４の歯ブラシ１の形態になる。
毛状ブラシ材２および柄軸１ｃは、ナイロンなどの合成樹脂からなるものを用いると、超音波で容易に溶着でき、柄軸１ｃからの毛状ブラシ材２の脱落防止ができる。
【図面の簡単な説明】
【００１９】
【図１】本発明の歯ブラシに用いる環状の毛状ブラシ材の実施形態を示す平面図である。
【図２】同毛状ブラシ材を用いた参考例の歯ブラシの上から見た概観図（正面図）である。
【図３】同歯ブラシの側面から見た概観図（側面図）である。
【図４】本発明の歯ブラシの実施形態を示す概観図（正面図）である。
【符号の説明】
【００２０】
１　歯ブラシ

１ｂ　柄
１ｃ　柄軸
２　毛状ブラシ材
２ａ　軸孔
２ｃ　ワッシャー

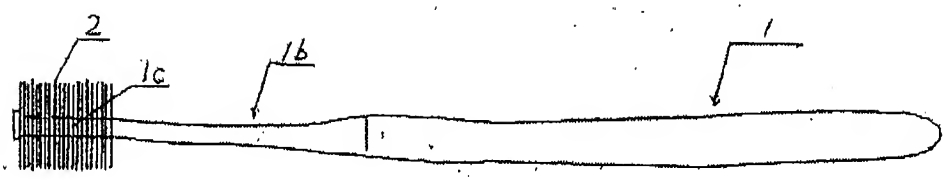
【図１】



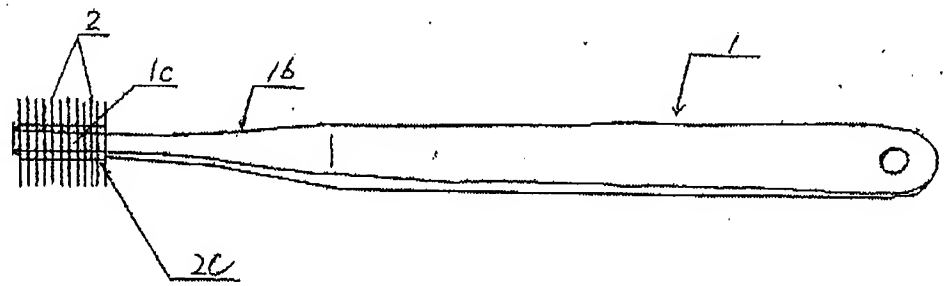
【図２】



【図３】



【図４】



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(58)調査した分野(Int.Cl.[7]，ＤＢ名)
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